

and the equatorial Pacific islands. Virtually no measurements of this type have been made directly on the Antarctic Continent. Seismographic instruments elsewhere in the world have shown that some of the largest earthquakes have occurred in the sub-Antarctic region and earthquakes are occurring on the continent itself.

United States scientists will set up their instruments in the Atlantic and the Pacific as well as on the North and South American Continents and in Antarctica. They will record natural earth tremors and earthquakes, and they will make their own artificial tremors with dynamite charges in order to measure ice thickness in the Antarctic. The United States information, combined with that of worldwide seismic studies by other nations participating in the IGY, will enable scientists to make a much better map than they have now of the interior of the earth.

GRAVITY MEASUREMENTS

The earth is not truly round, and scientists do not know exactly what shape it is. It is, of course, approximately globular, but it bulges at the Equator and flattens out at the poles. As a result, the pull of gravity varies from place to place all over the globe. It also varies because of local conditions, depending on the height above sea level and the distribution of mass in the earth's crust. Local variations in the pull of gravity give prospectors clues to the location of minerals and petroleum beneath the surface of the earth. But local variations, as well as the larger and more extensive regional variations, influence the precision of measurements made by astronomers and by cartographers laying the basic network for air maps.

Only in populated areas of the earth have reasonably complete measurements of gravity been made. The gap in the international network of gravity observations extends over most of the Southern Hemisphere and the Arctic regions, making it impossible to form an accurate picture of the world-gravity pattern.

Deep in the earth move tides, similar to ocean tides but on a smaller scale. Gravity measurements indicate the nature of these tides and thus provide a means for determination of the rigidity of the earth and the internal structure of the earth. Local variations in gravity, in addition to being useful in prospecting, give information for the study of such things as the thickness of ice over glaciated areas.

Although gravity measurements are made by many nations, there is no universally accepted gravity standard. Measurements in several European countries differ markedly, and no one has been able to estimate the difference in gravity measurements between continents. IGY scientists plan to extend the world gravity network to remote areas, to settle the differences in areas already surveyed, and to work toward the establishment of a gravity standard.

Gravimeters, instruments for measuring gravity in particular locations, give only relatively accurate data. This data must be coordinated with pendulum measurements, which are more accurate because of the sensitiveness of the pendulum apparatus. Gravimeter measurements must be taken as nearly simultaneously as possible at different points.

United States scientists will make gravity measurements during the IGY in the Western Hemisphere, the Arctic, the Antarctic, and the Atlantic and Pacific Oceans. Pendulum measurements will be used